



November 30, 2001

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
445 12th St. S.W.
12th Street Lobby, Room TW-A325
Washington, DC 20554

Re: Ex Parte Presentation
ET Docket No. 00-258 (Spectrum for Third Generation
(3G) Mobile Systems)

Dear Ms. Salas:

On behalf of Motorola, Inc., you are hereby notified that on November 29, 2001, I met with Julius Knapp and Lauren Van Wazer of the Office of Engineering and Technology and discussed the attached information.

In accordance with Section 1.49(f)(1) of the Commission's Rules, one electronic copy of this letter is being submitted via the Commission's Electronic Comment Filing System for inclusion in the record in the above-captioned proceedings.

Respectfully submitted,

/s/

Steve B. Sharkey
Director, Spectrum and Standards Strategy
Motorola, Inc.
1350 I St., NW Suite 400
Washington, DC 20005
(202) 371-6953

Cc: Julius Knapp
Lauren Van Wazer

Attachment

Reply issues on 00-258

MDS use of 1910-1930 MHz

- Key interference issue is MDS customer response station interfering with PCS receive base stations operating below 1910 MHz. Out of band emissions would have to be significantly reduced below levels currently allowed in the 2150 MHz band. Technical feasibility of MDS equipment with low out-of-band emissions may be questionable.

	MDS Current OOBE	MDS Reduced OOBE		Note
Transmit bandwidth	125.00	125.00	KHz	
EIRP	16.19	16.19	dBW	21.909(g)(3)
	46.19	46.19	dBm	
Out-of-band reduction	-60.00	-85.00	dB	-60 dB @ 3 MHz offset, 21.908(d)
Out-of-band EIRP	-3.81	-28.81	dBm/1.25 MHz	CDMA2000 Rx BW 1.25 MHz
PCS base receive gain	17.00	17.00	dB	8F/412, CDMA2000 1X
PCS receive sensitivity	-108.00	-108.00	dBm	8F/412, CDMA2000 1X
Degradation of Sensitivity	3.00	3.00	dB	
Interference level	-108.02	-108.02	dBm	
Required loss	121.21	96.21	dB	
Frequency	1910	1910	MHz	
Distance	4539.4	255.2	m	
Loss+10 dB	121.21	96.21	dB	Free Space plus 10 dB

- Technically comparable spectrum for MDS relocations is satisfied by the 2385-2400 MHz band, ITU-R Propagation recommendations indicate fractions of dB differences between the bands under consideration¹. Further issues that require evaluations are sharing with Amateur operations and potential for interference with unlicensed devices operating above 2400 MHz. Amateur operations in this band are for repeater links, amateur TV² and high-rate data applications. All are location specific applications and could be satisfied by relocation to other bands or geographic separation of amateur use outside of any deployed MDS system. It should be technically feasible for MDS to operate adjacent to unlicensed devices above 2400 MHz with a small guard band along with out-of-band emissions requirements similar to that in place for the 2150 MHz band.

¹ Using ITU-R P.1456 difference is propagation at 1910 MHz and 2400 MHz is computed to be 0.25 dB. Noting that MDS operations would use the same antenna size, with same efficiency, they would gain nearly 4 dB for a transmit receive pair. For example, a 1- foot antenna with 50 percent efficiency would have a peak gain of 14.6 dB at 2400 MHz and 12.69 dB at 1910 MHz.

² Amateur TV is identified to use 2390-2396 MHz, this use is 6 MHz out of a total of 85.8 MHz identified for use by ATV by the ARRL board of directors, see <http://www.arrl.org/FandES/field/regulations/bandplan.html>.

TDD use of 1910-1930 MHz

- Use of the 1910-1930 MHz band by TDD systems must ensure that existing operations in that band and adjacent bands are not interfered with, Motorola along with many other commenters support low power operations as the most efficient and feasible approach to ensure compatibility. Primary issues with a high-powered TDD system accessing this band are the potential for interference between TDD mobiles and PCS mobiles and inference between TDD base stations and PCS base stations.

While the ITU has yet to complete its conclusion on TDD/FDD it is clear that many key adopters of technology have concern with interference issues. For example when considering interference studies from Ericsson³, Siemens⁴, UK⁵, Tella AB⁶ and Motorola SA all indicate that that operation of a high powered TDD system within this band will have to face significant sharing issues in order not to cause interference to existing users.

It should be noted in the UK and Germany when awarding licenses for 3G applications that a similar situation exists that a TDD license is next to a FDD base receive license. The approach utilized to resolve interference trade offs taken by these administrations is to award both the TDD and FDD license to the same licensee. In this case the system engineering solutions to avoid interference that are proposed by Arraycom, Siemens and other TDD proponents is feasible, due to the fact that when the system is designed and deployed that licensee will determine the impact on itself with the trade off of system outage / filter requirements / deployment requirements between its TDD and FDD systems.

- Many commenters support flexible use of the 1910-1920 MHz band, these low power devices can be compatible with current applications using the 1920-1930 MHz band and PCS uses below 1910 MHz. In order to ensure this compatibility the power levels should be maintained below PCS mobile emissions levels and employ a listen-before-talk protocol⁷.

³ Use of statistical studies indicate mobile operation will be *severely* disturbed by other mobiles in certain deployment scenarios where statistical modeling make little sense, for example in buses, trains, sport arenas, malls, city centers. Results indicate that there is a need for a minimum of 10-15 MHz of guard bands in both spectrum borders when mixing TDD in between FDD uplink and downlink bands. See attachment 8.6 to WP 8F chairman's report summarizing studies by Ericsson, 8F/268.

⁴ Siemens report that the average contribution to loss of cell capacity are 5% or less, and may be typically around 1%, they find this loss is acceptable. See attachment 8.6 to WP 8F chairman's report summarizing studies by Siemens, 8F/268.

⁵ UK reports a significant loss of service over an area can be expected by mobiles in an adjacent channel to a TDD system. See attachment 8.6 to WP 8F chairman's report summarizing studies by UK, 8F/268.

⁶ Tella AB indicates that MS to MS interference creates blocking and dropping due to proximity of MS's which can't be compensated for to any large extent by reduction of cell load or extra base stations. The problem is therefore one of service level rather than one of capacity. From an operator as well as a customer point of view, service level requirements are even more important than requirements on capacity. They indicate that a 10 MHz guard band would be insufficient, 8F/480.

⁷ New entities should also 1) participate fully in funding microwave incumbent relocation cost; 2) bear the burden of demonstrating, prior to deployment of operations, that they will not cause interference to UPCS uses; and 3) agree to cease operations in the event of interference with UPCS operations.